Chemical Name: Afidopyropen
USEPA PC Code: 026200
USEPA MRID: 49689226
USEPA DP Barcode: 435146
PMRA Data Code (DACO): 9.2.4.8
PMRA Study No. (UKID): 2627491
Data Requirement: Non-guideline

Test Material: BAS 440 00 I (TEP, VERSYS™) **Purity:** 9.7%

Active Ingredient: Afidopyropen
IUPAC Name: [(3*S*,4*R*,4a*R*,6*S*,6a*S*,12*R*,12a*S*,12b*S*)-3-(cyclopropylcarbonyloxy)-1,2,3,4,4a,5,6,6a,12a,12b-decahydro-6,12-dihydroxy-4,6a,12b-trimethyl-11-oxo-9-(3-pyridyl)-11*H*,12*H*-benzo[*f*]pyrano[4,3-*b*]chromen-4-yl]methylcyclopropane carboxylate
CAS Name: [(3*S*,4*R*,4a*R*,6*S*,6a*S*,12*R*,12a*S*,12b*S*)-3-(cyclopropylcarbonyl)oxy)]-1,3,4,4a,5,6,6a,12,12a,12b-decahydro-6,12-dihydroxy-4,6a,12b-trimethyl-11-oxo-9-(3-pyridyl)-2*H*,11*H*-naphtho[2,1-*b*]pyrano[3,4-*e*]pyran-4-yl]methyl cyclopropanecarboxylate
CAS No.: 915972-17-7
Synonyms: INSCALIS™

Primary Reviewer: Thomas Steeger, Ph.D.,
Senior Science Advisor, USEPA/OSCP/OPP/EFED/ERB 4
Signature: THOMAS STEEGER Digitally signed by THOMAS STEEGER Date: 2018.02.20 12:18:42 -05'00'
Date: 15 February 2018

Secondary Reviewer: Cameron Douglass, Ph.D.
Biologist, USEPA/OSCP/OPP/EFED/ERB 4
Signature: Cameron Douglass 2018.02.15 14:42:21 -05'00'
Date: 15 February 2018

PMRA Reviewer: Vedad Izadi
Evaluation Officer, PMRA/EAD/ERSII
Date: 19 September 2017

Date Evaluation Completed: 19 September 2017

CITATION: Howerton, H. and L. Gilson. 2015. Determination of residues of BAS 440 00 I in Bee-relevant Matrices Collected from Tomatoes following a Full Bloom Foliar Application of BAS 440 00 I. SynTech Research Laboratory Services, LLC., 17745 S. Metcalf Ave., Stillwell, Kansas 66085. Report No. 733093. Sponsored by BASF SE.

Executive Summary:
A 5-day semi-field tunnel study was conducted with formulated afidopyropen (BAS 440 00 I SC; 9.7% active ingredient) applied as a foliar spray to tomatoes (*Lycopersicon esculentum* Mill) where residues of afidopyropen were determined in bee-relevant matrices (leaves, blossoms, and pollen). The test site consisted of 1 untreated control plot with 2 replicates/subplots and 1 treated plot with 3 replicates/subplots. Tomato seedlings were transplanted in each plot during summer of 2014. Prior to sampling, tunnels were erected over the tomato plants in each subplot (5 tunnels total) and 3 bumblebee colonies were placed in each tunnel. At full bloom, tomatoes in the treated plots received a

single foliar application of BAS 440 00 I (SC) at a rate of 50 g BAS 440 I/ha/application (0.272 lbs a.i./A). Bee-related matrices (pollen, flowers, and leaves) were sampled at approximately 4 hours on day 0 after application (0 DAA), 1 DAA, 2 DAA and, 5 DAA.

All samples were analyzed for afidopyropen residues using BASF Method D1412/01 for the "Determination of Residues of BAS 440 I and its Metabolite M440I007 in Bee Matrices". Afidopyropen residues in control samples of leaves, blossoms and pollen were below the limit of detection (LOD=0.01 mg ai/kg). Mean (± standard deviation) residues afidopyropen in leaves were 1.93 mg/kg ± 0.250 (peak=2.13 mg/kg) at 0 DAA, 0.843 ± 0.225 mg/kg (peak=1.06 mg/kg) at 1 DAA, 0.523 mg/kg ± 0.136 (peak=0.63 mg/kg) at 2 DAA, and were 0.263 ± 0.067 mg/kg (peak=0.34 mg/kg) at 4 DAA. Mean residues of the transformation product M440I007 in leaves were 4.55 ± 0.588 mg/kg (peak=5.10 mg/kg) at 0 DAA, 1.52 ± 0.246 mg/kg (peak=1.78 mg/kg) at 1 DAA, 0.67 ± 0.178 mg/kg (peak=0.81 mg/kg) at 2 DAA, and were 0.390 ± 0.070 mg/kg (peak= 0.47 mg/kg) at 4 DAA.

In flowers, mean afidopyropen residues were 1.42 mg/kg ± 0.237 (peak=1.67 mg/kg) at 0 DAA, 0.837 ± 0.275 mg/kg (peak=1.01 mg/kg) at 1 DAA, 0.467 ± 0.071 mg/kg (peak=0.53 mg/kg) at 2 DAA, and 0.270 ± 0.026 mg/kg (peak=0.30 mg/kg) at 4 DAA. Mean residues of M440I007 in flowers were 2.07 ± 0.399 mg/kg (peak=2.41 mg/kg) at 0 DAA, 1.19 ± 0.373 mg/kg (peak=1.49 mg/kg) at 1 DAA, 0.633 ± 0.166 mg/kg (peak=0.81 mg/kg) at 2 DAA, and 0.260 ± 0.044 mg/kg (peak= 0.31 mg/kg) at 4 DAA.

In pollen, no data are available for residues of the parent or transformation product at 0 DAA. Mean residues of afidopyropen were 0.067 mg/kg ± 0.015 (peak=0.08 mg/kg) at 1 DAA, 0.173 ± 0.031 mg/kg (peak=0.20 mg/kg) at 2 DAA, and 0.177 ± 0.059 mg/kg (peak=0.22 mg/kg) at 4 DAA. Mean residues of M440I007 in pollen were 0.107 ± 0.021 mg/kg (peak=0.13 mg/kg) at 1 DAA, 0.353 ± 0.090 mg/kg (peak=0.41 mg/kg) at 2 DAA, and 0.213 ± 0.075 mg/kg (peak=0.29 mg/kg) at 4 DAA.

In general, residues of both the parent and the transformation product in leaves and flowers declined by >80% from 0 – 4 DAA; residues of M440I007 ranged from 1.3 to 2.4x higher than those of the parent. In pollen though, afidopyropen residues increased by a factor of 2.6x from 1 – 4DAA; residues of the transformation product were 1.2 to 2x higher than the parent from 1 – 4DAA. Since residues in pollen were not measured on 0DAA, it is unknown whether afidopyropen and the M440I007 may have been higher on the day of application.

Results Synopsis:

Peak residues after foliar application of afidopyropen at nominal rate of 50 g a.i./ha (0.272 lbs a.i./A):

Leaves: 2.13 mg/kg (Parent); 5.10 mg/kg (M4401007)
Flowers: 1.67 mg/kg (Parent); 2.41 mg/kg (M4401007)
Pollen: 0.22 mg/kg (Parent); 0.41 mg/kg (M4401007)

EPA Classification: Supplemental (may be used quantitatively)
PMRA Classification: Reliable with restrictions

I. DATA SOURCE

USEPA MRID No.: 49689226
PMRA UKID: 2627491

Study Title:	Determination of residues of BAS 440 00 I in Bee-relevant Matrices Collected from Tomatoes following a Full Bloom Foliar Application of BAS 440 00 I
Study Author(s):	Howerton, H. and L. Gilson
Testing Laboratory:	SynTech Research Laboratory Services, LLC., 17745 S. Metcalf Ave., Stillwell, Kansas 66085
Laboratory Report No.:	733093
Sponsor Study No.:	BASF Reg. Doc. #: 2015/7001307
Study Completion Date:	23 December 2015
Data Access:	Data submitter is data owner
Data Protection Claimed:	Yes

II. MATERIALS AND METHODS

Test Guideline:	Non-guideline
Deviations from Guideline:	Test substance was not temperature monitored from June 6 0 August 13, 2014; pollen sample size 0DAA did not meet minimum sample size; although some pollen was to be retained, no such samples were retained as there was insufficient quantities to do so. An additional sample data (1 DAA) was included; water was added to some leaf and flower samples during analytical sample cleanup. Validation was performed at 1,000x limit of quantification (LOQ) rather than 100x LOQ given the high residue levels measured in the actual samples. Mass spectroscopy was conducted at 594 → 202 transition rather than the specified 435 → 202 transition. Incorrect spray volume was used during application. According to the study authors, none of the deviations to the protocol had an adverse effect on the validity of the study.
GLP Compliance:	Study conducted compliant with EPA Good Laboratory Practice requirements (40 CFR Part 160).

A. MATERIALS

Test Material:	BAS 440 00 I (Reg. no. 5 599 022) Active ingredient: BAS 440 I (afidopyropen) CAS Number 915972-17-7
Test Material Identity:	BAS 440 00 I Batch No. 1767-104-1; dispersible concentrate; 9.7% (w/w) 100 g a.i./L; density 1.0235 g/cm^3.

Details on Preparation and Application of Test Materials:

The treated plots received 1 application of BAS 440 00 I (SC) at a rate of 50 g BAS 440 I/ha. The target spray volume was 450 L/ha, however, the application was made to tomatoes at full-bloom with a spray volume of 339 L/ha.

Analytical Monitoring:	Yes
Details on Analytical Method:	All samples were analyzed for residues of afidopyropen using BASF Method D1412/01 ”Determination of Residues of BAS 440 I and its

Metabolite M440I007 in Bee Matrices using LC-MS/MS" at a limit of quantification (LOQ) of 0.01 mg/kg and a limit of detection (LOD) of 0.002 mg/kg was estimated at 20% of the LOQ. Residues of afidopyropen were extracted and partitioned using acetonitrile and salt solution, and then cleaned-up using dispersive solid-phase extraction (dSPE). The determination of afidopyropen was performed by high performance liquid chromatography (HPLC) positive ion electrospray ionization tandem mass spectrometry (MS/MS-ESI), monitoring ion transitions m/z 594→148 for BAS 440 I and m/z 1188→576 for the transformation product M440I007.The limit of quantification (LOQ) for BAS 440 I (afidopyropen) and M440I007 in bee-related matrices is 0.01 mg/kg each.

For validation, untreated leaves, flowers and pollen were fortified at 0.01 (1x LOQ) and 10 mg/kg (1000x LOQ); additionally, performance of the analytical methods was evaluated during each sample set by fortifying controls with a mixed standard containing each reference substances.

Reference Material: None
Reference Material Identity: N/A
Vehicle: N/A

Test Organism (Species): Bumblebees (*Bombus impatiens*)
Animal Group: Arthropoda/Insecta/Hymenoptera/Bombidae
Details on Test Organisms: Bumblebees were only used as sampling device. No biological observations were made. Bumblebees, *B.* impatiens. (Hymenoptera, *Bombidae*), as typical for commercial use were used as sampling device for pollen. The colonies were purchased from a commercial vendor (Koppert Biological Systems). Colonies (3/tunnel) were placed in tunnels four days prior to treatments. Hives were closed during test substance application and reopened after the spray had dried. Two days after application, another set of colonies (2/tunnel) were added to the tunnels for the final pollen collection events.

B. STUDY DESIGN AND METHODS

Study Type: Semi-field (tunnel) study
Test Duration Type: Determination of residues of afidopyropen and its transformation product M440I007 in bee-relevant matrices up to 5 days after application of the test item
Limit Test: Yes
Total Exposure Duration: 5 days
Post-Exposure Observation Period:
Bumblebees were only used as sampling device. No biological observations were made

Test Location: This residue study was conducted in Stilwell, Kansas, USA

Test Environmental Conditions:

Natural field conditions; according to the study report, actual temperature recordings ware comparable with average historical values for the application period. Air temperatures was at 75.8 °F during application of the test item; 82% relative humidity with the wind at 1.4 – 2.2 mph and no cloud cover

Photoperiod and Lighting: Natural (ambient) environmental conditions.

Nominal and Measured Concentrations:

The treated plots received 1 application of BAS 440 00 I (SC) at a rate of 50 g BAS 440 I/ha. The target spray volume was 450 L/ha, however, the application was made to tomatoes at full-bloom with a spray volume of 339 L/ha.

Test Plots: The tunnels were 279 m^2 (3,000 ft^2) in size 46 m L x 6.1 m W (150 ft L x 20 ft W) with a maximum height of 3 m (10 feet). Tunnels were covered with 3 - 4 mm insect proof mesh netting. The distance between the control and treated plots was approximately 61 m (200 ft). The approximate distance between treated tunnels was 3 m (10 ft). Three bumblebee colonies per tunnel were placed in the tunnels during the flowering period of the crop and allowed to forage for 4 days prior to the application and first pollen sampling event. Hives were closed during test substance application and reopened after the spray had dried. Two days after application another set of colonies (2 per tunnel) were added to the tunnels for the final pollen collection events.

Test Design: A total 25 bumble bee colonies were used for this trial. Colonies were removed from the tunnels after sampling. The bumblebees were used only as a sampling device for pollen collection from tomato crop. Samples of pollen loads (via foraging bumblebees), flowers, and leaves were collected. Sampling occurred at 4 hours after application on 0 DAA), 1 DAA (included since insufficient pollen was obtained at 0 DAA), 2 DAA, and 4 DAA. After sampling at 2 DAA, two additional bumblebee colonies were introduced to each tunnel. Matrices in both control subplots were sampled first or sampled by different technicians, to prevent contamination. Samples were then taken from the three afidopyropen-treated subplots. Leaf and flower samples were collected by passing through the plots and hand-collecting samples from at least 12 different sections and from all parts for the plants (*i.e.*, inside, outside, high, low). Samples of leaves and flowers were then split into 2 sub-samples (A for residue analysis and R to be retained). Pollen was sampled by collecting forager bumblebees with visible pollen loads. The bees were collected in jars with dry ice and the pollen was later scrapped off the bee and transferred to an amber jar. A minimum of 5 g of leaf and flower samples were collected for analysis.

III. **APPLICANT'S REPORTED RESULTS AND DISCUSSION**

Exposure Duration:	5 day*s*
Endpoint(s):	Residues of afidopyropen and its metabolite M440I007 in inflorescences of tomato plants as well as in pollen collected from bumblebees after exposure to flowering tomatoes, treated once with formulated afidopyropen (BAS 440 00 I; 9.7% a.i.) during flowering in a semi-field residue study in Stillwell, Kansas. All collected residue samples were stored deep frozen (≤ -18 °C) as soon as possible after sampling until shipment for residue analysis. The samples were shipped from the field test site by ACDS freezer truck to the analytical laboratory, BASF Corporation (Research Triangle Park, North Carolina).
Basis for Concentration:	Nominal
Effect Concentration Type:	Test material
Basis for Effect:	Measured residues in flowers and bee-collected pollen from treated tomato plants (*Lycopersicon esculentum*).

Applicant-Provided Results:
The study report indicates that mean recoveries from the leaves and pollen "shipping verification" were 83 and 91% of the applied afidopyropen, respectively, after 315 days of frozen storage. Method recoveries for afidopyropen and M4401007 in leaves ranged from 87 – 105% and 76 – 104% respectively. In flowers, recoveries for afidopyropen and M4401007 ranged from 72 – 105% and 72 – 111%, respectively. In pollen, recoveries for afidopyropen and M4401007 ranged from 85 – 97% and 81 – 135%, respectively.

According to the study authors, residues of afidopyropen were below the method LOD (<0.002 mg/kg) in/on all untreated control samples, field generated, and commercially purchased pollen. Mean residues afidopyropen in leaves were 1.93 mg/kg (range, 1.65 - 2.13 mg/kg) at 0 DAA, 0.84 mg/kg (range: 0.61 - 1.06 mg/kg) at 1 DAA, 0.52 mg/kg (range: 0.37 - 0.63 mg/kg) at 2 DAA, and were 0.26 mg/kg (range: 0.22 -0.34 mg/kg) at 4 DAA (**Table 1**). Mean residues of the transformation product M440I007 in leaves were 4.55 mg/kg (range: 3.93 - 5.10 mg/kg) at 0 DAA, 1.52 mg/kg (range: 1.29 - 1.78 mg/kg) at 1 DAA, 0.67 mg/kg (range: 0.47 - 0.81 mg/kg) at 2 DAA, and were 0.39 mg/kg (range: 0.34 - 0.47 mg/kg) at 4 DAA.

In flowers, mean afidopyropen residues were 1.42 mg/kg (range: 1.20 - 1.67 mg/kg) at 0 DAA, 0.84 mg/kg (range: 0.52 - 1.01 mg/kg) at 1 DAA, 0.47 mg/kg (range, 0.39-0.53 mg/kg) at 2 DAA, and 0.27 mg/kg (range: 0.25 - 0.30 mg/kg) at 4 DAA (**Table 1**). Mean residues of M440I007 in flowers were 2.07 mg/kg (range: 1.63 - 2.41 mg/kg) at 0 DAA, 1.19 mg/kg (range: 0.77 - 1.49 mg/kg) at 1 DAA, 0.63 mg/kg (range: 0.48 - 0.81 mg/kg) at 2 DAA, and 0.26 mg/kg (range: 0.23 - 0.31 mg/kg) at 4 DAA.

In pollen mean residues of afidopyropen were 0.07 mg/kg (range: 0.05 - 0.08 mg/kg) at 1 DAA, 0.17 mg/kg (range: 0.14 - 0.20 mg/kg) at 2 DAA, and 0.18 mg/kg (range: 0.11 - 0.22 mg/kg) at 4 DAA (**Table 1**). Mean residues of M440I007 in pollen were 0.11 mg/kg (range: 0.09 - 0.13 mg/kg) at 1 DAA, 0.35 mg/kg (range: 0.25 - 0.41 mg/kg) at 2 DAA, and 0.21 mg/kg (range: 0.14 - 0.29 mg/kg) at 4 DAA.

Table 1. Registrant summary of measured afidopyropen parent and M4401007 transformation product residues (range and mean) in leaves, flowers and bumblebee (*Bombus impatiens*)-collected pollen from tomatoes (*Lycopersicon esculentum*) at 0, 1, 2 and 4 days after application of afidopyropen typical end-use product BAS 440 00 I (9.7% active ingredient) during bloom.

Analyte (Matrix)	Days after treatment (DAA)	Residue levels [mg/kg]				
		n	BAS 440 I (afidopyropen)		M440I007	
			Range	Mean	Range	Mean
Leaves	0	3	1.65 – 2.13	1.93	3.93 – 5.10	4.55
	1	3	0.61 – 1.06	0.84	1.29 – 1.78	1.52
	2	3	0.37 – 0.63	0.52	0.47 – 0.81	0.67
	4	3	0.22 – 0.34	0.26	0.34 – 0.47	0.39
Flowers	0	3	1.20 – 1.67	1.42	1.63 – 2.41	2.07
	1	3	0.52 – 1.01	0.84	0.77 – 1.49	1.19
	2	3	0.39 – 0.53	0.47	0.48 – 0.81	0.63
	4	3	0.25 – 0.30	0.27	0.23 – 0.31	0.26
Pollen	0	3	NS	NS	NS	NS
	1	3	0.05 – 0.08	0.07	0.09 – 0.13	0.11
	2	3	0.14 – 0.20	0.17	0.25 – 0.41	0.35
	4	3	0.11 – 0.22	0.18	0.14 – 0.29	0.21

[NS] **No Sample due to insufficient sample size**.

Applicant-Reported Statistics and Error Estimates
Statistical treatment of the data included simple descripting statistics (*e.g.*, mean; range) for the residue and method recovery data, and calculation of the calibration curve and coefficient of variation (*r*) by linear regression of the instrument responses for the reference standards.

IV. OVERALL REMARKS, ATTACHMENTS

Multiple deviations from the study protocol were noted by the author; however, in general, the study authors did not believe these deviations impacted the scientific integrity of the study.

V. PRIMARY REVIEWER'S ANALYSIS AND CONCLUSIONS

Mean residues of parent afidopyropen and its M440I007 transformation product are consistent with those calculated by the study authors and reported in **Table 1**.

Reviewer's Statistical Verification:
Descriptive statistics on residue levels at various study sampling intervals were generated using the Proc Univariate procedure of SAS® (SAS Institute, Cary, NC).

Reviewer's Comments:
While the study report notes that samples of the foliar spray solution were collected for future analysis, there is no indication that application solutions were verified analytically. Therefore, there is uncertainty regarding actual exposure levels in terms of active ingredient applied as the nominal concentration in application solution was not verified analytically.

While the report notes that there was no precipitation on the day of application, no information is provided on the weather conditions on subsequent days. The report notes that bees were confined during application and until residues had dried; however, no information is provided on the time required for residues to dry. While the report indicates that the tomato plants were in full bloom, the actual plant development stage is not reported. Two additional colonies had to be added to each of the tunnels after 2 DAA to complete the pollen collection; however, it is unclear why the number was initially underestimated.

Table 2 summarizes the weight of leaves, flowers and pollen collected for each of the study replicates and indicates that at 0 DAA, the weight of pollen collected in controls ($C_a – C_b$) afidopyropen treatments ($T_a – T_c$) were 0.0 and 0.04 g, respectively. According to the study authors, the low amount of pollen collected at 0 DAA necessitated the additional of the 1 DAA sampling day. Pollen sample weights 1 DAA were 32% lower in afidopyropen-treated tunnels relative to controls; however, at 2 and 4 DAA, pollen sample sizes from afidopyropen and control colonies were relatively similar.

Table 2. Summary of tomato (*Lycopersicon esculentum*) leaf, flower and pollen sample weights for each control (C) and afidopyropen treated (T) replicate at different sampling intervals (days after treatment; DAA).

Replicate	Sample Interval	DAA	Sample Weight (g)	Mean Weight (g) per Treatment
C_a	Leaves	0	7.98	9.62
C_b			11.25	
T_a			15.60	17.3
T_b			14.69	
T_c			21.72	
C_a	Flowers	0	5.74	10.1
C_b			14.52	
T_a			6.65	5.73
T_b			5.29	
T_c			5.25	
C_a	Pollen	0	0.00	0.00
C_b				
T_a			0.04	0.04
T_b				
T_c				
C_a	Leaves	1	0.27	0.23
C_b			0.19	
T_a			0.14	0.12
T_b			0.10	
T_c			0.11	
C_a	Flowers	1	14.35	14.8
C_b			15.27	
T_a			12.01	16.0
T_b			22.85	
T_c			13.03	
C_a	Pollen	1	11.09	9.56

C_b			8.04	
T_a			5.99	6.48
T_b			6.33	
T_c			7.13	
C_a	Leaves	2	17.09	17.6
C_b			18.05	
T_a			9.72	16.6
T_b			18.55	
T_c			21.40	
C_a	Flowers	2	10.89	8.78
C_b			6.67	
T_a			7.98	8.85
T_b			7.03	
T_c			11.54	
C_a	Pollen	2	0.15	0.14
C_b			0.12	
T_a			0.20	0.15
T_b			0.10	
T_c			0.14	
C_a	Leaves	4	12.68	11.5
C_b			10.27	
T_a			9.22	19.0
T_b			24.94	
T_c			22.77	
C_a	Flowers	4	5.74	5.44
C_b			5.13	
T_a			6.08	6.77
T_b			6.17	
T_c			8.06	
C_a	Pollen	4	0.09	0.08
C_b			0.06	
T_a			0.15	0.14
T_b			0.11	
T_c			0.15	

Reviewer-calculated mean residues (± standard deviation) and peak residues of afidopyropen and its transformation product M440I007 are summarized in **Table 3**. Mean and peak values are similar to those reported by the study authors (**Table 1**). Mean and peak residues in leaves for both parent (1.93 ± 0.250; 2.13 mg a.i./kg) and the transformation product (4.55 ± 0.588; 5.10 mg/kg) were highest at 0 DAA. Similarly, mean and peak residues in flowers for both parent (1.417 ± 0.237; 1.67 mg a.i./kg) and transformation product (2.07 ± 0.399; 2.41 mg/kg) were highest at 0 DAA. For pollen, the mean and peak residues of the parent compound were highest (0.177 ± 0.059; 0.22 mg a.i./kg) at 4 DAA; however, residues of the transformation product were highest (0.353 ± 0.090; 0.41 mg/kg) at 2 DAA. It is important to note that no data are available for residue levels in pollen at 0 DAA. The residue data indicate that while residues of afidopyropen decreased in leaves and flowers by 86% and 81%, respectively, from 0 – 4 DAA, residues in pollen increased by a factor of 2.6x from 1 – 4 DAA. Data for M440I007 indicate that residues in leaves and flowers declined by 91% and 87%, respectively from 0 – 4 DAA while residues in pollen appear to have peaked at 2 DAA and then declined.

In leaves, the transformation product ranged from 1.3 – 2.4x higher than the parent compound over the study period; similarly, in flowers, the transformation product ranged from 1.4 – 1.5x higher than the parent from 0 – 2 DAA, but by 4 DAA, the residues of parent and transformation product were relatively similar. In pollen, the transformation product ranged from 1.2 – 2.0x higher than those of the parent compound from 1 – 4DAA.

Table 3. Summary of reviewer-calculated mean (± standard deviation) and peak measured afidopyropen parent and M4401007 transformation product residues in leaves, flowers and bumblebee (Bombus impatiens)-collected pollen from tomatoes (*Lycopersicon esculentum*) at 0, 1, 2 and 4 days after application.

Analyte (Matrix)	Days after treatment (DAA)	Residue levels [mg/kg]		
		n	Afidopyropen	M440I007
			Mean ± Std Dev (Peak)	Mean ± Std Dev (Peak)
Leaves	0	3	1.93 ± 0.250 (2.13)	4.55 ± 0.588 (5.10)
	1	3	0.843 ± 0.225 (1.06)	1.52 ± 0.246 (1.78)
	2	3	0.523 ± 0.136 (0.63)	0.670 ± 0.178 (0.81)
	4	3	0.263 ± 0.067 (0.34)	0.390 ± 0.070 (0.47)
Flowers	0	3	1.417 ± 0.237 (1.67)	2.07 ±0.399 (2.41)
	1	3	0.837 ± 0.275 (1.01)	1.187 ± 0.373 (1.49)
	2	3	0.467 ± 0.071 (0.53)	0.633 ± 0.166 (0.81)
	4	3	0.270 ± 0.026 (0.30)	0.260 ± 0.044 (0.31)
Pollen	0	3	NS	NS
	1	3	0.067 ± 0.015 (0.08)	0.107 ± 0.021 (0.13)
	2	3	0.173 ± 0.031 (0.20)	0.353 ± 0.090 (0.41)
	4	3	0.177 ± 0.059 (0.22)	0.213 ± 0.075 (0.29)

Reviewer's Conclusions:
In the 5-day study in which afidopyropen formulated product BAS 440 00 I (9.7% a.i.) was applied at a nominal rate of 50 g BAS 440 I/ha (0.272 lbs/A) to tomato plants at bloom mean residues of afidopyropen in leaves were 1.93 mg/kg (peak=2.13 mg/kg) at 0 DAA, 0.84 mg/kg (peak=1.06 mg/kg) at 1 DAA, 0.52 mg/kg (peak=0.63 mg/kg) at 2 DAA, and were 0.26 mg/kg (peak=0.34 mg/kg) at 4 DAA. Mean residues of the transformation product M440I007 in leaves were 4.55 mg/kg (peak=5.10 mg/kg) at 0 DAA, 1.52 mg/kg (peak=1.78 mg/kg) at 1 DAA, 0.67 mg/kg (peak=0.81 mg/kg) at 2 DAA, and were 0.39 mg/kg (peak= 0.47 mg/kg) at 4 DAA.

In flowers, mean afidopyropen residues were 1.42 mg/kg (peak=1.67 mg/kg) at 0 DAA, 0.84 mg/kg (peak=1.01 mg/kg) at 1 DAA, 0.467 mg/kg (peak=0.53 mg/kg) at 2 DAA, and 0.27 mg/kg (peak=0.30 mg/kg) at 4 DAA. Mean residues of M440I007 in flowers were 2.07 mg/kg (peak=1.63 - 2.41 mg/kg) at 0 DAA, 1.19 mg/kg (peak=1.49 mg/kg) at 1 DAA, 0.63 mg/kg (peak=0.81 mg/kg) at 2 DAA, and 0.26 mg/kg (peak= 0.31 mg/kg) at 4 DAA.

In pollen, no data are available for residues of the parent or transformation product at 0 DAA. Mean residues of afidopyropen were 0.07 mg/kg (peak=0.08 mg/kg) at 1 DAA, 0.17 mg/kg (peak=0.20 mg/kg) at 2 DAA, and 0.18 mg/kg (peak=0.22 mg/kg) at 4 DAA. Mean residues of M440I007 in pollen were 0.11 mg/kg (peak=0.13 mg/kg) at 1 DAA, 0.35 mg/kg (peak=0.41 mg/kg) at 2 DAA, and 0.21 mg/kg (peak=0.29 mg/kg) at 4 DAA.

In general, residues of both the parent and the transformation product in leaves and flowers declined by >80% from 0 – 4 DAA; residues of M440I007 ranged from 1.3 to 2.4x higher than those of the parent. In pollen though, afidopyropen residues increased by a factor of 2.6x from 1 – 4DAA; residues of the transformation product were 1.2 to 2x higher than the parent from 1 – 4DAA. Since residues in pollen were not measured on 0DAA, it is unknown whether afidopyropen and the M440I007 may have been higher on the day of application.

Peak residues after foliar application of afidopyropen at nominal rate of 50 g a.i./ha (0.272 lbs a.i./A):

Leaves: 2.13 mg/kg (Parent); 5.10 mg/kg (M4401007)
Flowers: 1.67 mg/kg (Parent); 2.41 mg/kg (M4401007)
Pollen: 0.22 mg/kg (Parent); 0.41 mg/kg (M4401007)

EPA Classification: Supplemental (may be used quantitatively)
PMRA Classification: Reliable with restrictions

APPENDIX I. Output of Statistics Verified by the Reviewer

DESCRIPTIVE STATISTICS FOR RESIDUES OF PARENT AND DEGRADATE IN VARIOUS MATRICES FROM TOMATO

The UNIVARIATE Procedure
Variable: PARENT
SAMPLE=Flowers DAA=0

Moments

N	3	**Sum Weights**	3
Mean	1.41666667	**Sum Observations**	4.25
Std Deviation	0.23713569	**Variance**	0.05623333
Skewness	0.67916867	**Kurtosis**	.
Uncorrected SS	6.1333	**Corrected SS**	0.11246667
Coeff Variation	16.7389896	**Std Error Mean**	0.13691035

Basic Statistical Measures

Location		**Variability**	
Mean	1.416667	**Std Deviation**	0.23714
Median	1.380000	**Variance**	0.05623
Mode	.	**Range**	0.47000
		Interquartile Range	0.47000

Tests for Location: Mu0=0

Test		**Statistic**	**p Value**	
Student's t	**t**	10.3474	**Pr > |t|**	0.0092
Sign	**M**	1.5	**Pr >= |M|**	0.2500
Signed Rank	**S**	3	**Pr >= |S|**	0.2500

Quantiles (Definition 5)

Level	**Quantile**
100% Max	1.67
99%	1.67
95%	1.67
90%	1.67
75% Q3	1.67
50% Median	1.38
25% Q1	1.20
10%	1.20

Quantiles (Definition 5)

Level	Quantile
5%	1.20
1%	1.20
0% Min	1.20

Extreme Observations

Lowest		Highest	
Value	**Obs**	**Value**	**Obs**
1.20	1	1.20	1
1.38	2	1.38	2
1.67	3	1.67	3

DESCRIPTIVE STATISTICS FOR RESIDUES OF PARENT AND DEGRADATE IN VARIOUS MATRICES FROM TOMATO

The UNIVARIATE Procedure
Variable: DEGRADATE
SAMPLE=Flowers DAA=0

Moments

N	3	**Sum Weights**	3
Mean	2.07	**Sum Observations**	6.21
Std Deviation	0.39949969	**Variance**	0.1596
Skewness	-1.0558319	**Kurtosis**	.
Uncorrected SS	13.1739	**Corrected SS**	0.3192
Coeff Variation	19.2995018	**Std Error Mean**	0.23065125

Basic Statistical Measures

Location		Variability	
Mean	2.070000	**Std Deviation**	0.39950
Median	2.170000	**Variance**	0.15960
Mode	.	**Range**	0.78000
		Interquartile Range	0.78000

Tests for Location: Mu0=0

Test		Statistic		p Value
Student's t	**t**	8.974588	**Pr > |t|**	0.0122
Sign	**M**	1.5	**Pr >= |M|**	0.2500
Signed Rank	**S**	3	**Pr >= |S|**	0.2500

Quantiles (Definition 5)

Level	Quantile
100% Max	2.41
99%	2.41
95%	2.41
90%	2.41
75% Q3	2.41
50% Median	2.17
25% Q1	1.63
10%	1.63

Quantiles (Definition 5)

Level	Quantile
5%	1.63
1%	1.63
0% Min	1.63

Extreme Observations

Lowest		Highest	
Value	**Obs**	**Value**	**Obs**
1.63	2	1.63	2
2.17	1	2.17	1
2.41	3	2.41	3

DESCRIPTIVE STATISTICS FOR RESIDUES OF PARENT AND DEGRADATE IN VARIOUS MATRICES FROM TOMATO

The UNIVARIATE Procedure
Variable: PARENT
SAMPLE=Flowers DAA=1

Moments

N	3	**Sum Weights**	3
Mean	0.83666667	**Sum Observations**	2.51
Std Deviation	0.27465129	**Variance**	0.07543333
Skewness	-1.7088314	**Kurtosis**	.
Uncorrected SS	2.2509	**Corrected SS**	0.15086667
Coeff Variation	32.8268479	**Std Error Mean**	0.15857

Basic Statistical Measures

Location		**Variability**	
Mean	0.836667	**Std Deviation**	0.27465
Median	0.980000	**Variance**	0.07543
Mode	.	**Range**	0.49000
		Interquartile Range	0.49000

Tests for Location: Mu0=0

Test		**Statistic**	**p Value**	
Student's t	**t**	5.276324	**Pr > |t|**	0.0341
Sign	**M**	1.5	**Pr >= |M|**	0.2500
Signed Rank	**S**	3	**Pr >= |S|**	0.2500

Quantiles (Definition 5)

Level	**Quantile**
100% Max	1.01
99%	1.01
95%	1.01
90%	1.01
75% Q3	1.01
50% Median	0.98
25% Q1	0.52
10%	0.52

Quantiles (Definition 5)

Level	Quantile
5%	0.52
1%	0.52
0% Min	0.52

Extreme Observations

Lowest		Highest	
Value	**Obs**	**Value**	**Obs**
0.52	4	0.52	4
0.98	5	0.98	5
1.01	6	1.01	6

DESCRIPTIVE STATISTICS FOR RESIDUES OF PARENT AND DEGRADATE IN VARIOUS MATRICES FROM TOMATO

The UNIVARIATE Procedure
Variable: DEGRADATE
SAMPLE=Flowers DAA=1

Moments

N	3	**Sum Weights**	3
Mean	1.18666667	**Sum Observations**	3.56
Std Deviation	0.37313983	**Variance**	0.13923333
Skewness	-1.2406927	**Kurtosis**	.
Uncorrected SS	4.503	**Corrected SS**	0.27846667
Coeff Variation	31.4443678	**Std Error Mean**	0.21543238

Basic Statistical Measures

Location		**Variability**	
Mean	1.186667	**Std Deviation**	0.37314
Median	1.300000	**Variance**	0.13923
Mode	.	**Range**	0.72000
		Interquartile Range	0.72000

Tests for Location: Mu0=0

Test		**Statistic**	**p Value**	
Student's t	**t**	5.508302	**Pr > |t|**	0.0314
Sign	**M**	1.5	**Pr >= |M|**	0.2500
Signed Rank	**S**	3	**Pr >= |S|**	0.2500

Quantiles (Definition 5)

Level	**Quantile**
100% Max	1.49
99%	1.49
95%	1.49
90%	1.49
75% Q3	1.49
50% Median	1.30
25% Q1	0.77
10%	0.77

Quantiles (Definition 5)

Level	Quantile
5%	0.77
1%	0.77
0% Min	0.77

Extreme Observations

Lowest		Highest	
Value	**Obs**	**Value**	**Obs**
0.77	4	0.77	4
1.30	6	1.30	6
1.49	5	1.49	5

DESCRIPTIVE STATISTICS FOR RESIDUES OF PARENT AND DEGRADATE IN VARIOUS MATRICES FROM TOMATO

The UNIVARIATE Procedure
Variable: PARENT
SAMPLE=Flowers DAA=2

Moments

N	3	**Sum Weights**	3
Mean	0.46666667	**Sum Observations**	1.4
Std Deviation	0.07094599	**Variance**	0.00503333
Skewness	-0.8158431	**Kurtosis**	.
Uncorrected SS	0.6634	**Corrected SS**	0.01006667
Coeff Variation	15.2027119	**Std Error Mean**	0.04096069

Basic Statistical Measures

Location		**Variability**	
Mean	0.466667	**Std Deviation**	0.07095
Median	0.480000	**Variance**	0.00503
Mode	.	**Range**	0.14000
		Interquartile Range	0.14000

Tests for Location: Mu0=0

Test		**Statistic**	**p Value**	
Student's t	**t**	11.39304	**Pr > |t|**	0.0076
Sign	**M**	1.5	**Pr >= |M|**	0.2500
Signed Rank	**S**	3	**Pr >= |S|**	0.2500

Quantiles (Definition 5)

Level	**Quantile**
100% Max	0.53
99%	0.53
95%	0.53
90%	0.53
75% Q3	0.53
50% Median	0.48
25% Q1	0.39
10%	0.39

Quantiles (Definition 5)

Level	Quantile
5%	0.39
1%	0.39
0% Min	0.39

Extreme Observations

Lowest		Highest	
Value	**Obs**	**Value**	**Obs**
0.39	8	0.39	8
0.48	7	0.48	7
0.53	9	0.53	9

DESCRIPTIVE STATISTICS FOR RESIDUES OF PARENT AND DEGRADATE IN VARIOUS MATRICES FROM TOMATO

The UNIVARIATE Procedure
Variable: DEGRADATE
SAMPLE=Flowers DAA=2

Moments

N	3	**Sum Weights**	3
Mean	0.63333333	**Sum Observations**	1.9
Std Deviation	0.16623277	**Variance**	0.02763333
Skewness	0.61919947	**Kurtosis**	.
Uncorrected SS	1.2586	**Corrected SS**	0.05526667
Coeff Variation	26.2472792	**Std Error Mean**	0.09597453

Basic Statistical Measures

Location		**Variability**	
Mean	0.633333	**Std Deviation**	0.16623
Median	0.610000	**Variance**	0.02763
Mode	.	**Range**	0.33000
		Interquartile Range	0.33000

Tests for Location: Mu0=0

Test		**Statistic**	**p Value**	
Student's t	**t**	6.598973	**Pr > |t|**	0.0222
Sign	**M**	1.5	**Pr >= |M|**	0.2500
Signed Rank	**S**	3	**Pr >= |S|**	0.2500

Quantiles (Definition 5)

Level	**Quantile**
100% Max	0.81
99%	0.81
95%	0.81
90%	0.81
75% Q3	0.81
50% Median	0.61
25% Q1	0.48
10%	0.48

Quantiles (Definition 5)

Level	Quantile
5%	0.48
1%	0.48
0% Min	0.48

Extreme Observations

Lowest		Highest	
Value	**Obs**	**Value**	**Obs**
0.48	8	0.48	8
0.61	7	0.61	7
0.81	9	0.81	9

DESCRIPTIVE STATISTICS FOR RESIDUES OF PARENT AND DEGRADATE IN VARIOUS MATRICES FROM TOMATO

The UNIVARIATE Procedure
Variable: PARENT
SAMPLE=Flowers DAA=4

Moments

N	3	**Sum Weights**	3
Mean	0.27	**Sum Observations**	0.81
Std Deviation	0.02645751	**Variance**	0.0007
Skewness	1.45786297	**Kurtosis**	.
Uncorrected SS	0.2201	**Corrected SS**	0.0014
Coeff Variation	9.79907893	**Std Error Mean**	0.01527525

Basic Statistical Measures

Location		**Variability**	
Mean	0.270000	**Std Deviation**	0.02646
Median	0.260000	**Variance**	0.0007000
Mode	.	**Range**	0.05000
		Interquartile Range	0.05000

Tests for Location: Mu0=0

Test		**Statistic**	**p Value**	
Student's t	**t**	17.67565	**Pr > |t|**	0.0032
Sign	**M**	1.5	**Pr >= |M|**	0.2500
Signed Rank	**S**	3	**Pr >= |S|**	0.2500

Quantiles (Definition 5)

Level	**Quantile**
100% Max	0.30
99%	0.30
95%	0.30
90%	0.30
75% Q3	0.30
50% Median	0.26
25% Q1	0.25
10%	0.25

Quantiles (Definition 5)

Level	Quantile
5%	0.25
1%	0.25
0% Min	0.25

Extreme Observations

Lowest		Highest	
Value	**Obs**	**Value**	**Obs**
0.25	10	0.25	10
0.26	11	0.26	11
0.30	12	0.30	12

DESCRIPTIVE STATISTICS FOR RESIDUES OF PARENT AND DEGRADATE IN VARIOUS MATRICES FROM TOMATO

The UNIVARIATE Procedure
Variable: DEGRADATE
SAMPLE=Flowers DAA=4

Moments

N	3	**Sum Weights**	3
Mean	0.26	**Sum Observations**	0.78
Std Deviation	0.04358899	**Variance**	0.0019
Skewness	1.63005916	**Kurtosis**	.
Uncorrected SS	0.2066	**Corrected SS**	0.0038
Coeff Variation	16.7649959	**Std Error Mean**	0.02516611

Basic Statistical Measures

Location		**Variability**	
Mean	0.260000	**Std Deviation**	0.04359
Median	0.240000	**Variance**	0.00190
Mode	.	**Range**	0.08000
		Interquartile Range	0.08000

Tests for Location: Mu0=0

Test		**Statistic**	**p Value**	
Student's t	**t**	10.33135	**Pr > |t|**	0.0092
Sign	**M**	1.5	**Pr >= |M|**	0.2500
Signed Rank	**S**	3	**Pr >= |S|**	0.2500

Quantiles (Definition 5)

Level	**Quantile**
100% Max	0.31
99%	0.31
95%	0.31
90%	0.31
75% Q3	0.31
50% Median	0.24
25% Q1	0.23
10%	0.23

Quantiles (Definition 5)

Level	Quantile
5%	0.23
1%	0.23
0% Min	0.23

Extreme Observations

Lowest		Highest	
Value	**Obs**	**Value**	**Obs**
0.23	11	0.23	11
0.24	10	0.24	10
0.31	12	0.31	12

DESCRIPTIVE STATISTICS FOR RESIDUES OF PARENT AND DEGRADATE IN VARIOUS MATRICES FROM TOMATO

The UNIVARIATE Procedure
Variable: PARENT
SAMPLE=Leaves DAA=0

Moments

N	3	**Sum Weights**	3
Mean	1.93	**Sum Observations**	5.79
Std Deviation	0.24979992	**Variance**	0.0624
Skewness	-1.2933428	**Kurtosis**	.
Uncorrected SS	11.2995	**Corrected SS**	0.1248
Coeff Variation	12.943001	**Std Error Mean**	0.14422205

Basic Statistical Measures

Location		**Variability**	
Mean	1.930000	**Std Deviation**	0.24980
Median	2.010000	**Variance**	0.06240
Mode	.	**Range**	0.48000
		Interquartile Range	0.48000

Tests for Location: Mu0=0

Test		**Statistic**	**p Value**	
Student's t	**t**	13.38214	**Pr > |t|**	0.0055
Sign	**M**	1.5	**Pr >= |M|**	0.2500
Signed Rank	**S**	3	**Pr >= |S|**	0.2500

Quantiles (Definition 5)

Level	**Quantile**
100% Max	2.13
99%	2.13
95%	2.13
90%	2.13
75% Q3	2.13
50% Median	2.01
25% Q1	1.65
10%	1.65

Quantiles (Definition 5)

Level	Quantile
5%	1.65
1%	1.65
0% Min	1.65

Extreme Observations

Lowest		Highest	
Value	**Obs**	**Value**	**Obs**
1.65	13	1.65	13
2.01	14	2.01	14
2.13	15	2.13	15

DESCRIPTIVE STATISTICS FOR RESIDUES OF PARENT AND DEGRADATE IN VARIOUS MATRICES FROM TOMATO

The UNIVARIATE Procedure
Variable: DEGRADATE
SAMPLE=Leaves DAA=0

Moments

N	3	**Sum Weights**	3
Mean	4.54666667	**Sum Observations**	13.64
Std Deviation	0.5875656	**Variance**	0.34523333
Skewness	-0.4794166	**Kurtosis**	.
Uncorrected SS	62.707	**Corrected SS**	0.69046667
Coeff Variation	12.922997	**Std Error Mean**	0.33923116

Basic Statistical Measures

Location		Variability	
Mean	4.546667	**Std Deviation**	0.58757
Median	4.610000	**Variance**	0.34523
Mode	.	**Range**	1.17000
		Interquartile Range	1.17000

Tests for Location: Mu0=0

Test		Statistic		p Value
Student's t	**t**	13.40286	**Pr > |t|**	0.0055
Sign	**M**	1.5	**Pr >= |M|**	0.2500
Signed Rank	**S**	3	**Pr >= |S|**	0.2500

Quantiles (Definition 5)

Level	Quantile
100% Max	5.10
99%	5.10
95%	5.10
90%	5.10
75% Q3	5.10
50% Median	4.61
25% Q1	3.93
10%	3.93

Quantiles (Definition 5)

Level	Quantile
5%	3.93
1%	3.93
0% Min	3.93

Extreme Observations

Lowest		Highest	
Value	**Obs**	**Value**	**Obs**
3.93	13	3.93	13
4.61	14	4.61	14
5.10	15	5.10	15

DESCRIPTIVE STATISTICS FOR RESIDUES OF PARENT AND DEGRADATE IN VARIOUS MATRICES FROM TOMATO

The UNIVARIATE Procedure
Variable: PARENT
SAMPLE=Leaves DAA=1

Moments

N	3	**Sum Weights**	3
Mean	0.84333333	**Sum Observations**	2.53
Std Deviation	0.22546249	**Variance**	0.05083333
Skewness	-0.3308318	**Kurtosis**	.
Uncorrected SS	2.2353	**Corrected SS**	0.10166667
Coeff Variation	26.7346823	**Std Error Mean**	0.13017083

Basic Statistical Measures

Location		**Variability**	
Mean	0.843333	**Std Deviation**	0.22546
Median	0.860000	**Variance**	0.05083
Mode	.	**Range**	0.45000
		Interquartile Range	0.45000

Tests for Location: Mu0=0

Test		**Statistic**	**p Value**	
Student's t	**t**	6.478666	**Pr > |t|**	0.0230
Sign	**M**	1.5	**Pr >= |M|**	0.2500
Signed Rank	**S**	3	**Pr >= |S|**	0.2500

Quantiles (Definition 5)

Level	**Quantile**
100% Max	1.06
99%	1.06
95%	1.06
90%	1.06
75% Q3	1.06
50% Median	0.86
25% Q1	0.61
10%	0.61

Quantiles (Definition 5)

Level	Quantile
5%	0.61
1%	0.61
0% Min	0.61

Extreme Observations

Lowest		Highest	
Value	**Obs**	**Value**	**Obs**
0.61	16	0.61	16
0.86	18	0.86	18
1.06	17	1.06	17

DESCRIPTIVE STATISTICS FOR RESIDUES OF PARENT AND DEGRADATE IN VARIOUS MATRICES FROM TOMATO

The UNIVARIATE Procedure
Variable: DEGRADATE
SAMPLE=Leaves DAA=1

Moments

N	3	**Sum Weights**	3
Mean	1.52333333	**Sum Observations**	4.57
Std Deviation	0.24583192	**Variance**	0.06043333
Skewness	0.42327316	**Kurtosis**	.
Uncorrected SS	7.0825	**Corrected SS**	0.12086667
Coeff Variation	16.1377629	**Std Error Mean**	0.14193113

Basic Statistical Measures

Location		Variability	
Mean	1.523333	**Std Deviation**	0.24583
Median	1.500000	**Variance**	0.06043
Mode	.	**Range**	0.49000
		Interquartile Range	0.49000

Tests for Location: Mu0=0

Test		Statistic		p Value
Student's t	**t**	10.73291	**Pr > |t|**	0.0086
Sign	**M**	1.5	**Pr >= |M|**	0.2500
Signed Rank	**S**	3	**Pr >= |S|**	0.2500

Quantiles (Definition 5)

Level	Quantile
100% Max	1.78
99%	1.78
95%	1.78
90%	1.78
75% Q3	1.78
50% Median	1.50
25% Q1	1.29
10%	1.29

Quantiles (Definition 5)

Level	Quantile
5%	1.29
1%	1.29
0% Min	1.29

Extreme Observations

Lowest		Highest	
Value	**Obs**	**Value**	**Obs**
1.29	16	1.29	16
1.50	17	1.50	17
1.78	18	1.78	18

DESCRIPTIVE STATISTICS FOR RESIDUES OF PARENT AND DEGRADATE IN VARIOUS MATRICES FROM TOMATO

The UNIVARIATE Procedure
Variable: PARENT
SAMPLE=Leaves DAA=2

Moments

N	3	**Sum Weights**	3
Mean	0.52333333	**Sum Observations**	1.57
Std Deviation	0.13613719	**Variance**	0.01853333
Skewness	-1.3613014	**Kurtosis**	.
Uncorrected SS	0.8587	**Corrected SS**	0.03706667
Coeff Variation	26.013475	**Std Error Mean**	0.07859884

Basic Statistical Measures

Location		**Variability**	
Mean	0.523333	**Std Deviation**	0.13614
Median	0.570000	**Variance**	0.01853
Mode	.	**Range**	0.26000
		Interquartile Range	0.26000

Tests for Location: Mu0=0

Test		**Statistic**	**p Value**	
Student's t	**t**	6.658283	**Pr > |t|**	0.0218
Sign	**M**	1.5	**Pr >= |M|**	0.2500
Signed Rank	**S**	3	**Pr >= |S|**	0.2500

Quantiles (Definition 5)

Level	**Quantile**
100% Max	0.63
99%	0.63
95%	0.63
90%	0.63
75% Q3	0.63
50% Median	0.57
25% Q1	0.37
10%	0.37

Quantiles (Definition 5)

Level	Quantile
5%	0.37
1%	0.37
0% Min	0.37

Extreme Observations

Lowest		Highest	
Value	**Obs**	**Value**	**Obs**
0.37	19	0.37	19
0.57	20	0.57	20
0.63	21	0.63	21

DESCRIPTIVE STATISTICS FOR RESIDUES OF PARENT AND DEGRADATE IN VARIOUS MATRICES FROM TOMATO

The UNIVARIATE Procedure
Variable: DEGRADATE
SAMPLE=Leaves DAA=2

Moments

N	3	**Sum Weights**	3
Mean	0.67	**Sum Observations**	2.01
Std Deviation	0.17776389	**Variance**	0.0316
Skewness	-1.345833	**Kurtosis**	.
Uncorrected SS	1.4099	**Corrected SS**	0.0632
Coeff Variation	26.5319236	**Std Error Mean**	0.10263203

Basic Statistical Measures

Location		**Variability**	
Mean	0.670000	**Std Deviation**	0.17776
Median	0.730000	**Variance**	0.03160
Mode	.	**Range**	0.34000
		Interquartile Range	0.34000

Tests for Location: Mu0=0

Test		**Statistic**	**p Value**	
Student's t	**t**	6.528177	**Pr > |t|**	0.0227
Sign	**M**	1.5	**Pr >= |M|**	0.2500
Signed Rank	**S**	3	**Pr >= |S|**	0.2500

Quantiles (Definition 5)

Level	**Quantile**
100% Max	0.81
99%	0.81
95%	0.81
90%	0.81
75% Q3	0.81
50% Median	0.73
25% Q1	0.47
10%	0.47

Quantiles (Definition 5)

Level	Quantile
5%	0.47
1%	0.47
0% Min	0.47

Extreme Observations

Lowest		Highest	
Value	**Obs**	**Value**	**Obs**
0.47	19	0.47	19
0.73	21	0.73	21
0.81	20	0.81	20

DESCRIPTIVE STATISTICS FOR RESIDUES OF PARENT AND DEGRADATE IN VARIOUS MATRICES FROM TOMATO

The UNIVARIATE Procedure
Variable: PARENT
SAMPLE=Leaves DAA=4

Moments

N	3	**Sum Weights**	3
Mean	0.26333333	**Sum Observations**	0.79
Std Deviation	0.06658328	**Variance**	0.00443333
Skewness	1.6882018	**Kurtosis**	.
Uncorrected SS	0.2169	**Corrected SS**	0.00886667
Coeff Variation	25.2847903	**Std Error Mean**	0.03844188

Basic Statistical Measures

Location		**Variability**	
Mean	0.263333	**Std Deviation**	0.06658
Median	0.230000	**Variance**	0.00443
Mode	.	**Range**	0.12000
		Interquartile Range	0.12000

Tests for Location: Mu0=0

Test		**Statistic**	**p Value**	
Student's t	**t**	6.850169	**Pr > |t|**	0.0207
Sign	**M**	1.5	**Pr >= |M|**	0.2500
Signed Rank	**S**	3	**Pr >= |S|**	0.2500

Quantiles (Definition 5)

Level	**Quantile**
100% Max	0.34
99%	0.34
95%	0.34
90%	0.34
75% Q3	0.34
50% Median	0.23
25% Q1	0.22
10%	0.22

Quantiles (Definition 5)

Level	Quantile
5%	0.22
1%	0.22
0% Min	0.22

Extreme Observations

Lowest		Highest	
Value	**Obs**	**Value**	**Obs**
0.22	23	0.22	23
0.23	22	0.23	22
0.34	24	0.34	24

DESCRIPTIVE STATISTICS FOR RESIDUES OF PARENT AND DEGRADATE IN VARIOUS MATRICES FROM TOMATO

The UNIVARIATE Procedure
Variable: DEGRADATE
SAMPLE=Leaves DAA=4

Moments

N	3	**Sum Weights**	3
Mean	0.39	**Sum Observations**	1.17
Std Deviation	0.07	**Variance**	0.0049
Skewness	1.57434402	**Kurtosis**	.
Uncorrected SS	0.4661	**Corrected SS**	0.0098
Coeff Variation	17.9487179	**Std Error Mean**	0.04041452

Basic Statistical Measures

Location		**Variability**	
Mean	0.390000	**Std Deviation**	0.07000
Median	0.360000	**Variance**	0.00490
Mode	.	**Range**	0.13000
		Interquartile Range	0.13000

Tests for Location: Mu0=0

Test		**Statistic**	**p Value**	
Student's t	**t**	9.649997	**Pr > |t|**	0.0106
Sign	**M**	1.5	**Pr >= |M|**	0.2500
Signed Rank	**S**	3	**Pr >= |S|**	0.2500

Quantiles (Definition 5)

Level	**Quantile**
100% Max	0.47
99%	0.47
95%	0.47
90%	0.47
75% Q3	0.47
50% Median	0.36
25% Q1	0.34
10%	0.34

Quantiles (Definition 5)

Level	Quantile
5%	0.34
1%	0.34
0% Min	0.34

Extreme Observations

Lowest		Highest	
Value	**Obs**	**Value**	**Obs**
0.34	22	0.34	22
0.36	23	0.36	23
0.47	24	0.47	24

DESCRIPTIVE STATISTICS FOR RESIDUES OF PARENT AND DEGRADATE IN VARIOUS MATRICES FROM TOMATO

The UNIVARIATE Procedure
Variable: PARENT
SAMPLE=Pollen DAA=1

Moments

N	3	**Sum Weights**	3
Mean	0.06666667	**Sum Observations**	0.2
Std Deviation	0.01527525	**Variance**	0.00023333
Skewness	-0.9352195	**Kurtosis**	.
Uncorrected SS	0.0138	**Corrected SS**	0.00046667
Coeff Variation	22.9128785	**Std Error Mean**	0.00881917

Basic Statistical Measures

Location		**Variability**	
Mean	0.066667	**Std Deviation**	0.01528
Median	0.070000	**Variance**	0.0002333
Mode	.	**Range**	0.03000
		Interquartile Range	0.03000

Tests for Location: Mu0=0

Test		**Statistic**	**p Value**	
Student's t	**t**	7.559289	**Pr > |t|**	0.0171
Sign	**M**	1.5	**Pr >= |M|**	0.2500
Signed Rank	**S**	3	**Pr >= |S|**	0.2500

Quantiles (Definition 5)

Level	**Quantile**
100% Max	0.08
99%	0.08
95%	0.08
90%	0.08
75% Q3	0.08
50% Median	0.07
25% Q1	0.05
10%	0.05

Quantiles (Definition 5)

Level	Quantile
5%	0.05
1%	0.05
0% Min	0.05

Extreme Observations

Lowest		Highest	
Value	**Obs**	**Value**	**Obs**
0.05	25	0.05	25
0.07	26	0.07	26
0.08	27	0.08	27

DESCRIPTIVE STATISTICS FOR RESIDUES OF PARENT AND DEGRADATE IN VARIOUS MATRICES FROM TOMATO

The UNIVARIATE Procedure
Variable: DEGRADATE
SAMPLE=Pollen DAA=1

Moments

N	3	**Sum Weights**	3
Mean	0.10666667	**Sum Observations**	0.32
Std Deviation	0.02081666	**Variance**	0.00043333
Skewness	1.29334278	**Kurtosis**	.
Uncorrected SS	0.035	**Corrected SS**	0.00086667
Coeff Variation	19.5156187	**Std Error Mean**	0.0120185

Basic Statistical Measures

Location		**Variability**	
Mean	0.106667	**Std Deviation**	0.02082
Median	0.100000	**Variance**	0.0004333
Mode	.	**Range**	0.04000
		Interquartile Range	0.04000

Tests for Location: Mu0=0

Test		**Statistic**	**p Value**	
Student's t	**t**	8.875203	**Pr > |t|**	0.0125
Sign	**M**	1.5	**Pr >= |M|**	0.2500
Signed Rank	**S**	3	**Pr >= |S|**	0.2500

Quantiles (Definition 5)

Level	**Quantile**
100% Max	0.13
99%	0.13
95%	0.13
90%	0.13
75% Q3	0.13
50% Median	0.10
25% Q1	0.09
10%	0.09

Quantiles (Definition 5)

Level	Quantile
5%	0.09
1%	0.09
0% Min	0.09

Extreme Observations

Lowest		Highest	
Value	**Obs**	**Value**	**Obs**
0.09	27	0.09	27
0.10	25	0.10	25
0.13	26	0.13	26

DESCRIPTIVE STATISTICS FOR RESIDUES OF PARENT AND DEGRADATE IN VARIOUS MATRICES FROM TOMATO

The UNIVARIATE Procedure
Variable: PARENT
SAMPLE=Pollen DAA=2

Moments

N	3	**Sum Weights**	3
Mean	0.17333333	**Sum Observations**	0.52
Std Deviation	0.0305505	**Variance**	0.00093333
Skewness	-0.9352195	**Kurtosis**	.
Uncorrected SS	0.092	**Corrected SS**	0.00186667
Coeff Variation	17.6252911	**Std Error Mean**	0.01763834

Basic Statistical Measures

Location		**Variability**	
Mean	0.173333	**Std Deviation**	0.03055
Median	0.180000	**Variance**	0.0009333
Mode	.	**Range**	0.06000
		Interquartile Range	0.06000

Tests for Location: Mu0=0

Test		**Statistic**	**p Value**	
Student's t	**t**	9.827076	**Pr > |t|**	0.0102
Sign	**M**	1.5	**Pr >= |M|**	0.2500
Signed Rank	**S**	3	**Pr >= |S|**	0.2500

Quantiles (Definition 5)

Level	**Quantile**
100% Max	0.20
99%	0.20
95%	0.20
90%	0.20
75% Q3	0.20
50% Median	0.18
25% Q1	0.14
10%	0.14

Quantiles (Definition 5)

Level	Quantile
5%	0.14
1%	0.14
0% Min	0.14

Extreme Observations

Lowest		Highest	
Value	**Obs**	**Value**	**Obs**
0.14	28	0.14	28
0.18	30	0.18	30
0.20	29	0.20	29

DESCRIPTIVE STATISTICS FOR RESIDUES OF PARENT AND DEGRADATE IN VARIOUS MATRICES FROM TOMATO

The UNIVARIATE Procedure
Variable: DEGRADATE
SAMPLE=Pollen DAA=2

Moments

N	3	**Sum Weights**	3
Mean	0.35333333	**Sum Observations**	1.06
Std Deviation	0.08962886	**Variance**	0.00803333
Skewness	-1.7078264	**Kurtosis**	.
Uncorrected SS	0.3906	**Corrected SS**	0.01606667
Coeff Variation	25.3666597	**Std Error Mean**	0.05174725

Basic Statistical Measures

Location		**Variability**	
Mean	0.353333	**Std Deviation**	0.08963
Median	0.400000	**Variance**	0.00803
Mode	.	**Range**	0.16000
		Interquartile Range	0.16000

Tests for Location: Mu0=0

Test		**Statistic**	**p Value**	
Student's t	**t**	6.82806	**Pr > |t|**	0.0208
Sign	**M**	1.5	**Pr >= |M|**	0.2500
Signed Rank	**S**	3	**Pr >= |S|**	0.2500

Quantiles (Definition 5)

Level	**Quantile**
100% Max	0.41
99%	0.41
95%	0.41
90%	0.41
75% Q3	0.41
50% Median	0.40
25% Q1	0.25
10%	0.25

Quantiles (Definition 5)

Level	Quantile
5%	0.25
1%	0.25
0% Min	0.25

Extreme Observations

Lowest		Highest	
Value	**Obs**	**Value**	**Obs**
0.25	28	0.25	28
0.40	30	0.40	30
0.41	29	0.41	29

DESCRIPTIVE STATISTICS FOR RESIDUES OF PARENT AND DEGRADATE IN VARIOUS MATRICES FROM TOMATO

The UNIVARIATE Procedure
Variable: PARENT
SAMPLE=Pollen DAA=4

Moments

N	3	**Sum Weights**	3
Mean	0.17666667	**Sum Observations**	0.53
Std Deviation	0.05859465	**Variance**	0.00343333
Skewness	-1.5078085	**Kurtosis**	.
Uncorrected SS	0.1005	**Corrected SS**	0.00686667
Coeff Variation	33.1667846	**Std Error Mean**	0.03382964

Basic Statistical Measures

Location		**Variability**	
Mean	0.176667	**Std Deviation**	0.05859
Median	0.200000	**Variance**	0.00343
Mode	.	**Range**	0.11000
		Interquartile Range	0.11000

Tests for Location: Mu0=0

Test		**Statistic**	**p Value**	
Student's t	**t**	5.222245	**Pr > |t|**	0.0348
Sign	**M**	1.5	**Pr >= |M|**	0.2500
Signed Rank	**S**	3	**Pr >= |S|**	0.2500

Quantiles (Definition 5)

Level	**Quantile**
100% Max	0.22
99%	0.22
95%	0.22
90%	0.22
75% Q3	0.22
50% Median	0.20
25% Q1	0.11
10%	0.11

Quantiles (Definition 5)

Level	Quantile
5%	0.11
1%	0.11
0% Min	0.11

Extreme Observations

Lowest		Highest	
Value	**Obs**	**Value**	**Obs**
0.11	33	0.11	33
0.20	31	0.20	31
0.22	32	0.22	32

DESCRIPTIVE STATISTICS FOR RESIDUES OF PARENT AND DEGRADATE IN VARIOUS MATRICES FROM TOMATO

The UNIVARIATE Procedure
Variable: DEGRADATE
SAMPLE=Pollen DAA=4

Moments

N	3	**Sum Weights**	3
Mean	0.21333333	**Sum Observations**	0.64
Std Deviation	0.07505553	**Variance**	0.00563333
Skewness	0.19945783	**Kurtosis**	.
Uncorrected SS	0.1478	**Corrected SS**	0.01126667
Coeff Variation	35.182282	**Std Error Mean**	0.04333333

Basic Statistical Measures

Location		Variability	
Mean	0.213333	**Std Deviation**	0.07506
Median	0.210000	**Variance**	0.00563
Mode	.	**Range**	0.15000
		Interquartile Range	0.15000

Tests for Location: Mu0=0

Test		Statistic		p Value
Student's t	**t**	4.923077	**Pr > |t|**	0.0389
Sign	**M**	1.5	**Pr >= |M|**	0.2500
Signed Rank	**S**	3	**Pr >= |S|**	0.2500

Quantiles (Definition 5)

Level	Quantile
100% Max	0.29
99%	0.29
95%	0.29
90%	0.29
75% Q3	0.29
50% Median	0.21
25% Q1	0.14
10%	0.14

Quantiles (Definition 5)

Level	Quantile
5%	0.14
1%	0.14
0% Min	0.14

Extreme Observations

Lowest		Highest	
Value	**Obs**	**Value**	**Obs**
0.14	33	0.14	33
0.21	31	0.21	31
0.29	32	0.29	32